MR-9300W

GEP and General Export Model

ISO

Set using ISO screws

SPECIFICATIONS

Circuit System:	16-transistor 10-diode superheterodyne, Matrix Sound stereo decoder 1-transistor for auxiliary circuit
Frequency Coverage:	FM 87.5～108 MHz (3.42～2.78 m) AM 530～1,605 kHz (566～187 m)
Intermediate Frequency:	FM 10.7 MHz AM 455 kHz
Antenna System:	FM built-in telescopic antenna or external antenna AM built-in ferrite bar antenna
Sensitivity at 50 mW output:	FM 4 μV (12 dB) at S/N 30 dB AM 80 μV/m (38 dB/m)
Selectivity at ±10 kHz off-resonance:	30 dB at 1,400 kHz
Power Output at 10% distortion:	1.6W (800 mWx2)
maximum:	2.4W (1.2Wx2)
Current Drain at zero signal:	35 mA
maximum:	560 mA
Power Requirement:	Four "D" size flashlight batteries 6V in total AC 220/240V, 50/60 Hz
Speaker:	10.7 cm (4") x 7 cm (2¾") three pieces, impedance 8Ω
Dimensions:	262 mm (W) x 147.5 mm (H) x 150 mm (D) (10 5/16" x 5 13/16" x 6")
Weight:	2.1 kg (4 lb 6 oz) with batteries

SONY®

SERVICE MANUAL

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SECTION 1
OUTLINE

1-1. BLOCK DIAGRAM

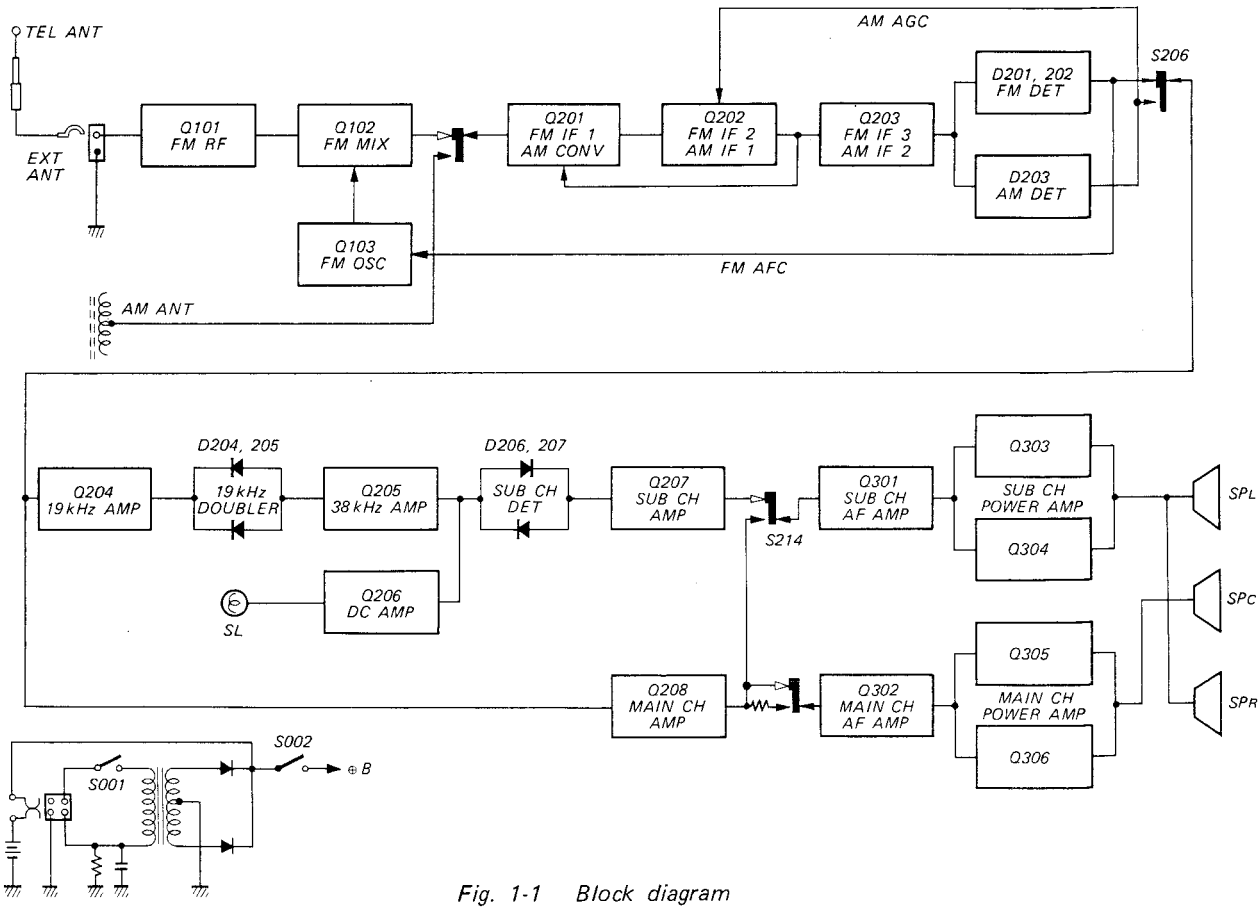
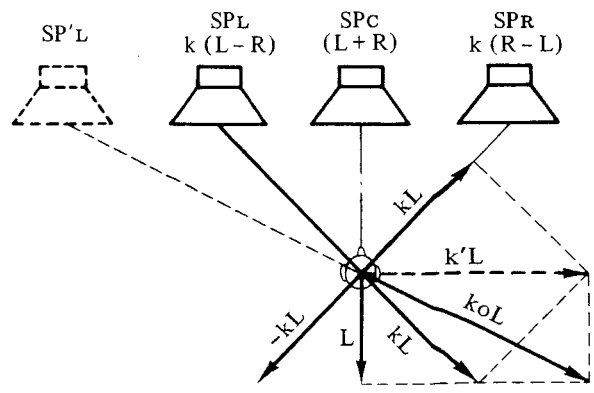


Fig. 1-1 Block diagram

1-2. CIRCUIT EXPLANATION

The model MR-9300W stereo decoder system is quite different from the commonly-used multiplex decoder system and is called Matrix Sound Stereo. In an ordinary stereo system, input stereo signals are separated into left- and right-channel signals in circuitry before the speakers. In the Matrix Sound Stereo, stereophonic sounds are produced by mixing the output of the speakers.

The speaker system is shown in Fig. 1-2. The main channel signal (L + R), which consists of both L- and R-channels, directly drives the center-speaker (SPC). The sub-channel signal (L - R) and its phase-reversal signal (R - L) drive the left-speaker (SPL) and right-speaker (SPR) reversely.



k: sound pressure ratio

Fig. 1-2 Speaker system

Now, consider only L-sound. If the L-component output of the left-speaker is kL, then that of the right-speaker is -kL and that of the center-speaker is L (here k is the sound pressure ratio of sub- and main-channels). As the result of combining these three sound vectors, koL is obtained and the listener actually hears the L-channel sound as koL. Thus, to the listener it appears as though he hears the sound from the imaginary speaker (SP'L) located on the koL vector. Therefore, in Matrix Sound Stereo, without using a switching circuit or matrix circuit, sufficient stereophonic sound is obtained with limited separation of the speakers. From a single cabinet, the sounds thus reproduced are rich and powerful ... wide, deep, and with directivity surrounding the cabinet.

The frequency spectrum of a composite stereo signal is shown in Fig. 1-3. The block diagram and the schematic diagram of the decoder circuit is shown in Fig. 1-4 and Fig. 1-5 respectively.

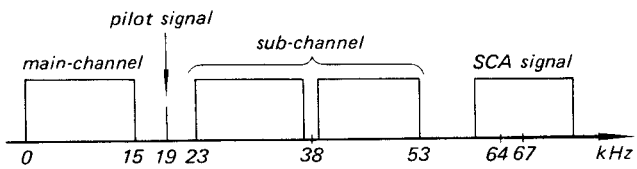


Fig. 1-3 Composite stereo signal spectrum

1. Main-channel Signal (L + R)

After passing through the 67-kHz-trap coil (L209), the components of the composite signal higher in frequency than 15 kHz are removed by the low-pass filter consisting of resistor R241 and capacitor C250. The resulting main-channel signal is amplified by transistor Q208.

2. Sub-channel Signal (L - R)

The composite signal appearing at the emitter of Q204 has frequencies below 23 kHz removed by the high-pass filter which consists of R244, R247, C243 and L212. The resulting sub-channel signal (L - R) is added to the secondary winding of 38-kHz resonant transformer L211.

3. Pilot Signal (19 kHz)

Pilot signal is recovered from the composite stereo signal by a 19-kHz-resonant circuit (L210) in the collector of Q204. The 19 kHz pilot signal is changed into 38-kHz sub-carrier by frequency doubler diodes D204 and D205. The pulse waveform at the base of Q205 is amplified and then restored to a sinusoidal waveform by the resonant primary of L211.

Here, the sub-carrier and the sub-channel signal (L - R) are added and demodulated by diodes D206 and D207 to produce sub-channel audio. This (L - R) signal is amplified by Q207. Then, the main- and sub-channel signals are applied to the each circuit to drive the speakers; the left-speaker with (L - R) signal, the center-speaker with (L + R) signal, and the right-speaker with (R - L) signal.

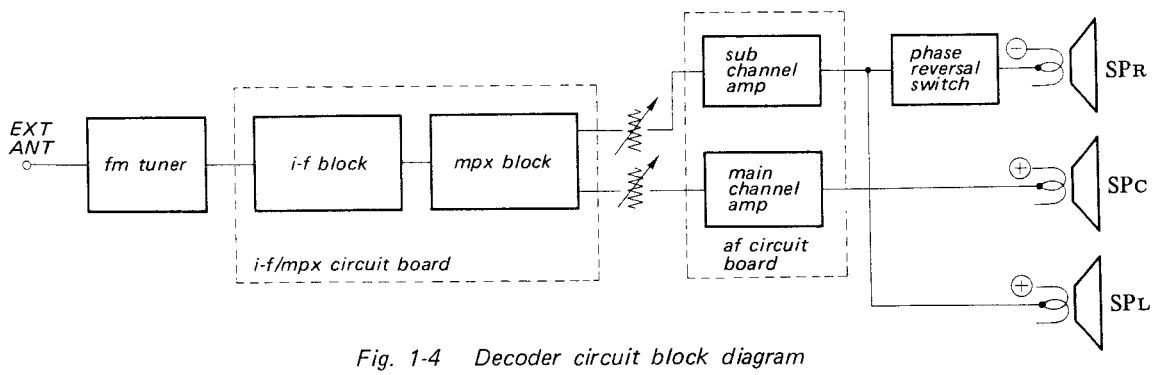


Fig. 1-4 Decoder circuit block diagram

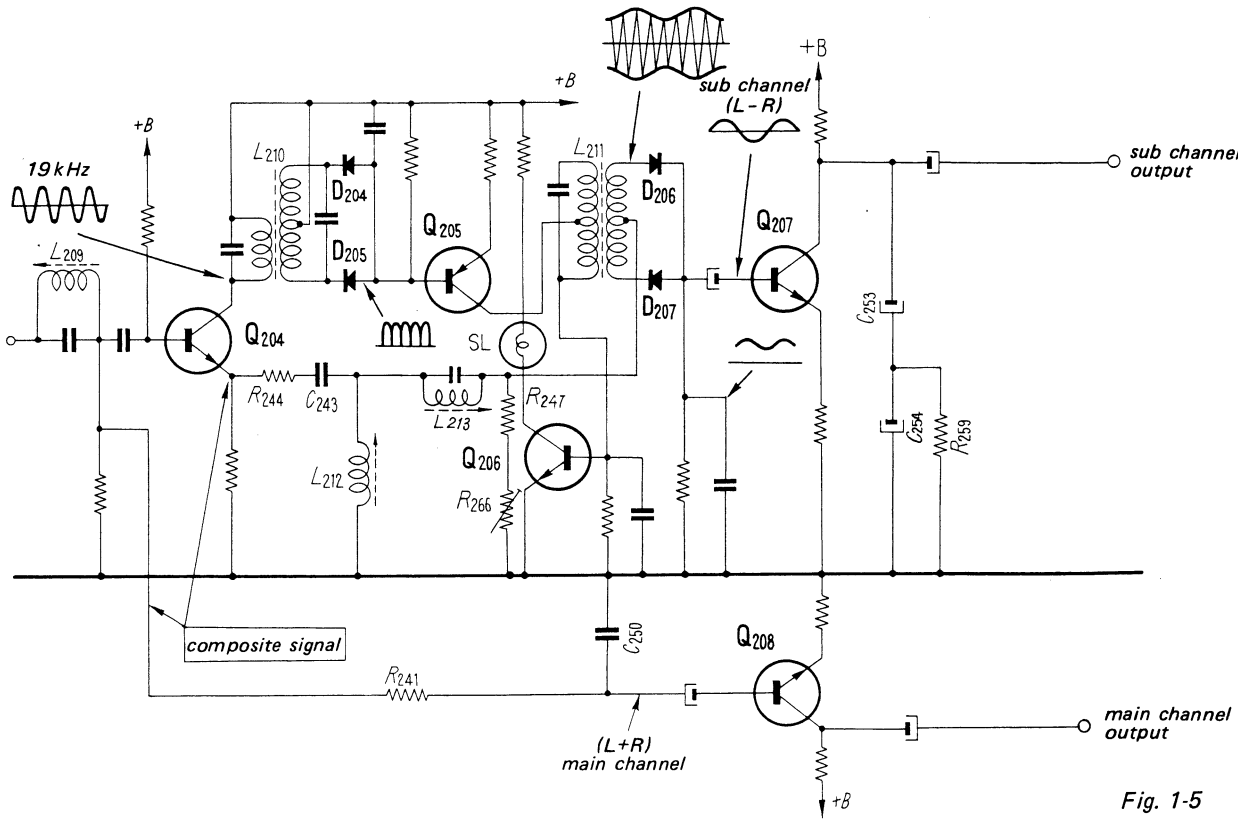

19kHz
+B
+B
+B
+B
sub channel
(L-R)
sub channel
output
L209
L210
L211
D204
D205
D206
D207
Q204
Q205
Q206
Q207
Q208
SL
R244
C243
L213
R247
L212
R266
C253
C254
R259
C250
R241
composite signal
(L+R)
main channel
main channel
output

Fig. 1-5

1-3. EXTERNAL VIEW

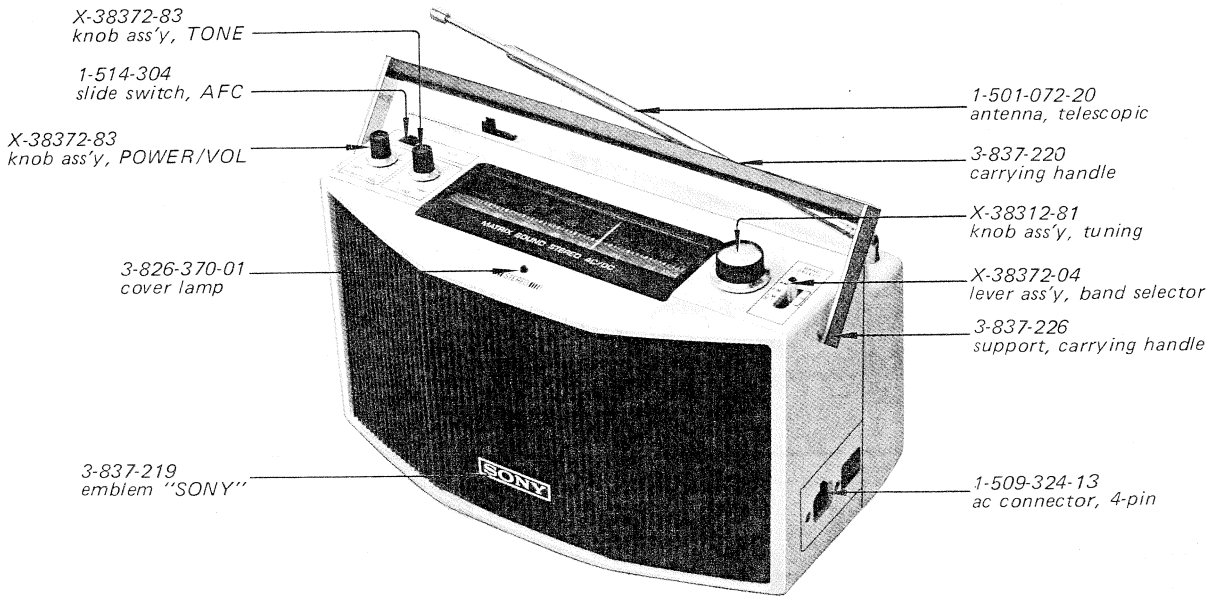


Fig. 1-6

1-4. INTERNAL VIEW

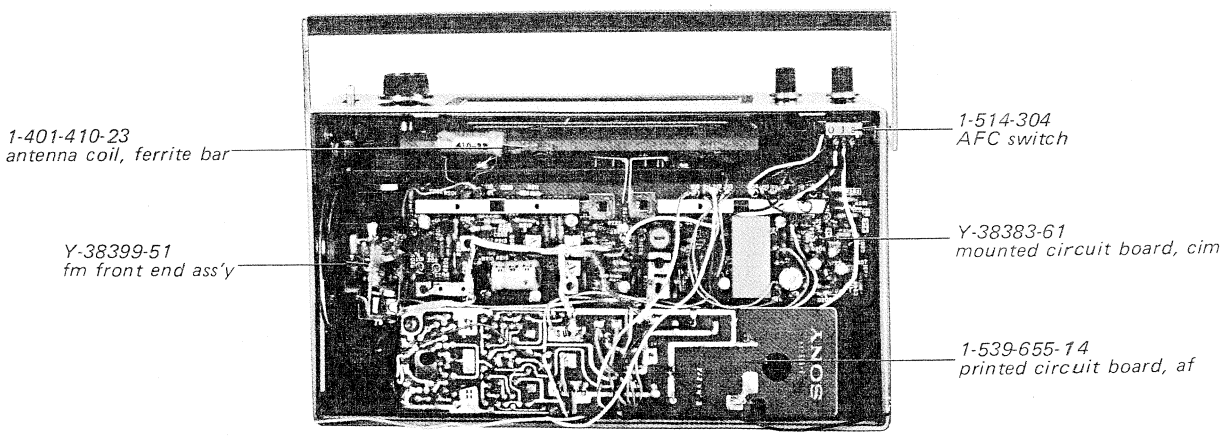


Fig. 1-7

2-4. CIM CIRCUIT BOARD REMOVAL

1. Unsolder the sixteen wires and tuning capacitor terminal shown in Fig. 2-5 and Fig. 2-6.
2. Remove the two screws shown in Fig. 2-6.
3. Remove the cim circuit board as shown by the arrows in Fig. 2-6.

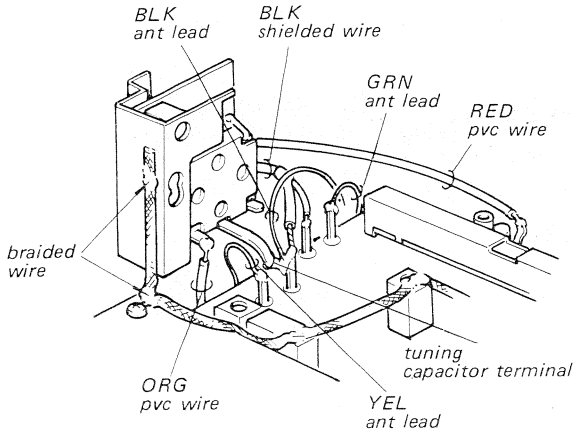


Fig. 2-5

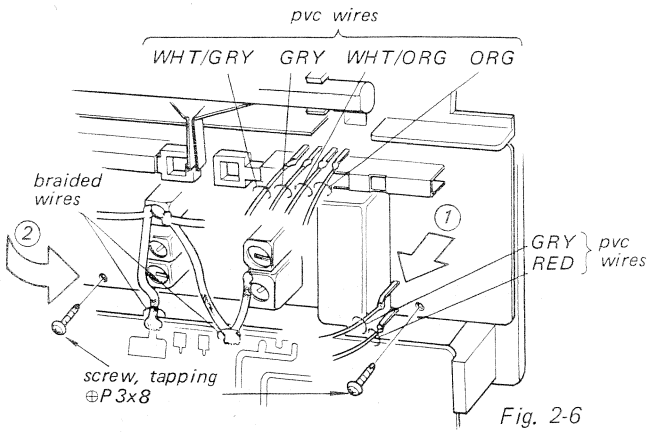


Fig. 2-6

2-5. FM FRONT END REMOVAL

1. Unsolder the three wires and the tuning capacitor terminal shown in Fig. 2-7.
2. Remove the three screws shown in Fig. 2-8.

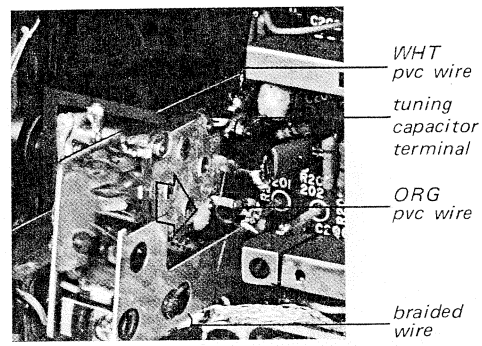


Fig. 2-7

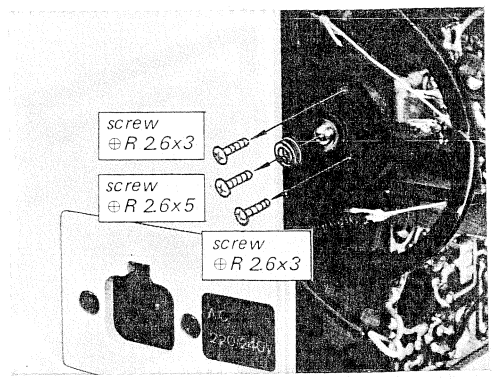


Fig. 2-8

Hardware Nomenclature

P – Pan Head Screw

PS – Pan Head Screw with Spring Washer

K – Flat Countersunk Head Screw

B – Binding Head Screw

RK – Oval Countersunk Head Screw

T – Truss Head Screw

R – Round Head Screw

F – Flat Fillister Head Screw

SC – Set Screw

E – Retaining Ring (E Washer)

W – Washer
SW – Spring Washer
LW – Lock Washer
N – Nut

– Example –

⊕ P 3x10
- Type of Slot
- Length in mm (L)
- Diameter in mm (D)
- Type of Head

SECTION 2
DISASSEMBLY

2-1. REAR CABINET REMOVAL

1. Remove the battery lid as shown in Fig. 2-1.
2. Remove the two screws shown in Fig. 2-1.
3. Remove the rear cabinet as shown in Fig. 2-2.
4. Unsolder the three wires shown in Fig. 2-2.

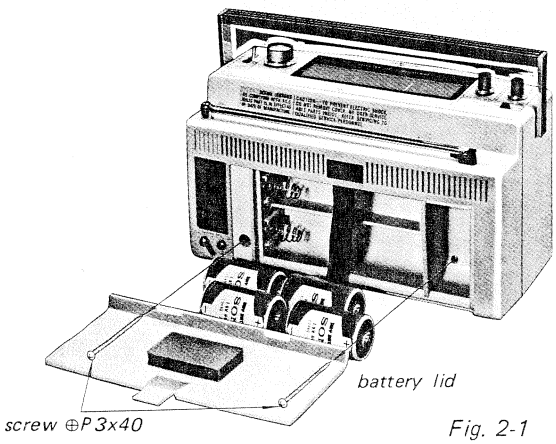


Fig. 2-1

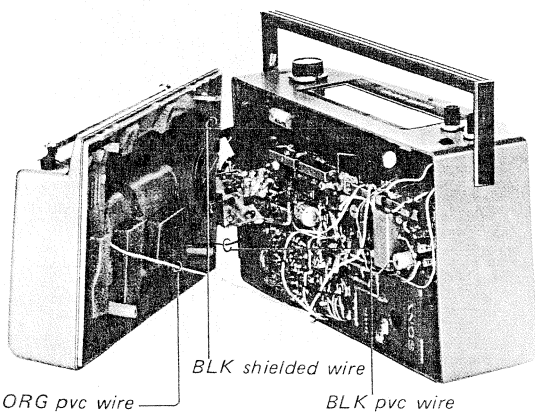


Fig. 2-2

2-2. CHASSIS REMOVAL

1. Remove the three knobs (tuning, POWER/VOL, TONE).
2. Unsolder the seven wires shown in Fig. 2-3.
3. Remove the two screws shown in Fig. 2-3.
4. Remove the chassis in the direction shown by the arrow. Remove the stereo-lamp from the lamp holder when the chassis is removed a little.

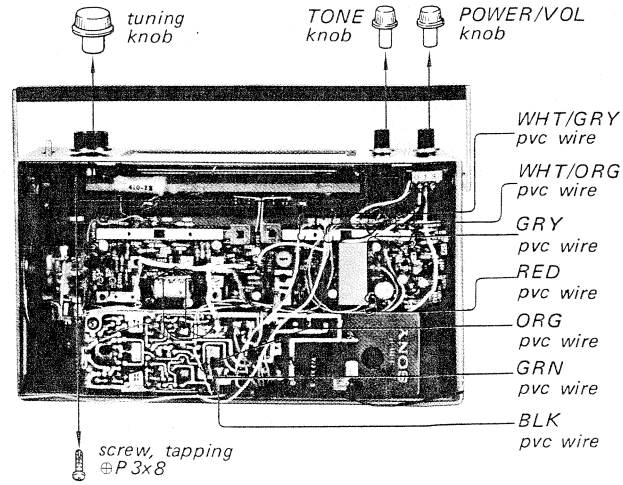


Fig. 2-3

2-3. AF CIRCUIT BOARD REMOVAL

1. Remove the six wires shown in Fig. 2-4.
2. Remove the two screws shown in Fig. 2-4.
3. Remove the af circuit board in the direction shown by the arrow.

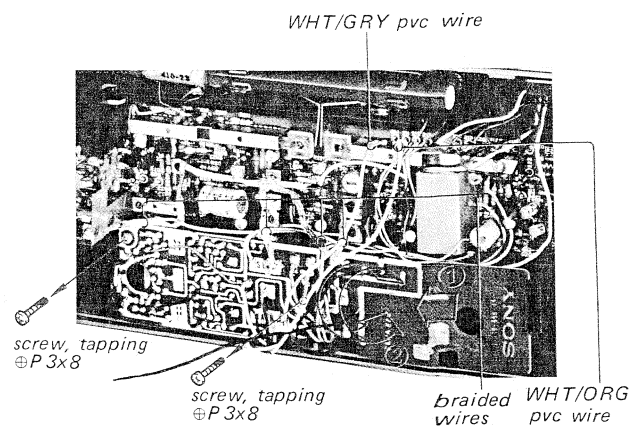


Fig. 2-4

2-6. DIAL CORD STRINGING

1. Cut the dial cord (0.3 mm dia.) by the length of about 1 m.
2. Rotate the dial drum fully clockwise.
3. Set the dial cord in numerical order as shown in Fig. 2-8.
4. Hook the spring on the drum and fix the cord with the eyelet by stretching the spring.
5. Fix the both knots of the dial cord with a contact cement.

Pointer Setting

After stringing, set the pointer as follows.

1. Rotate the drum fully counterclockwise.
2. Set the pointer on the pointer setting position.
3. Fix the pointer with a contact cement.

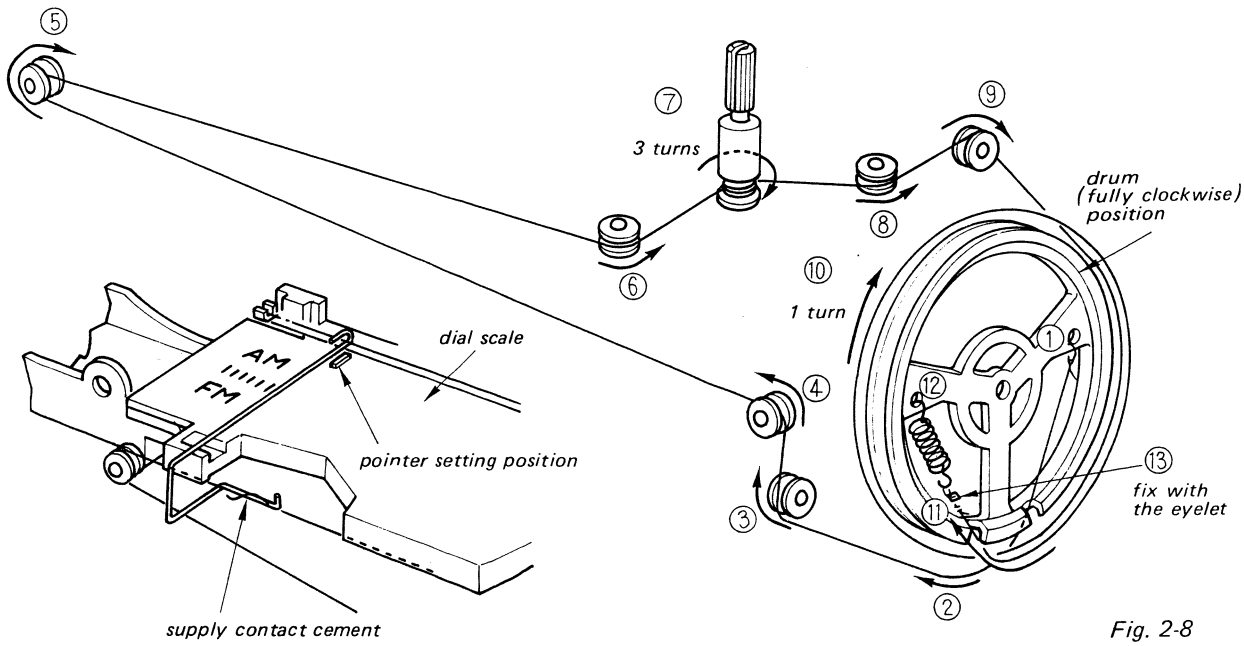


Fig. 2-8

SECTION 3
CIRCUIT ADJUSTMENTS

3-1. AM IF ALIGNMENT

Test Equipments/Tools Required:
* Rf signal generator (for a-m)
* VTVM
* Loop antenna
* Screwdriver for alignment

Preparation:
1. Band Selector : AM
2. TONE : HIGH
3. VOL : MAX
4. Tuning Knob : Fully clockwise

Rf Signal Generator Coupling	Rf Signal Generator Frequency	VTVM Connection	Adjust
Loop antenna (See Fig. 3-2)	455 kHz (1 kHz 30% a-m)	On af circuit board (See Fig. 3-1)	CFT (Adjust for maximum meter reading.)

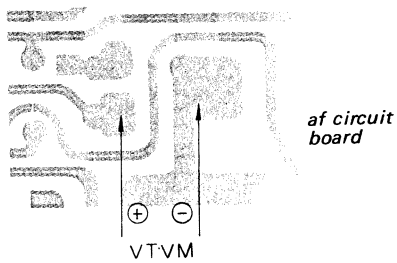


Fig. 3-1. VTVM connection

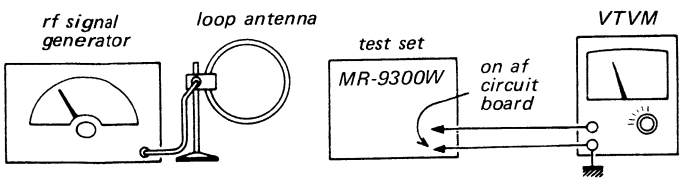


Fig. 3-2. Am i-f alignment setup

3-2. FM IF ALIGNMENT

Test Equipments/Tools Required:
* 10.7 MHz sweep generator with 10.7 MHz marker generator
* Oscilloscope
* Screwdriver for alignment

Preparation:
1. Sweep/Marker Generator Connection : Across the tuning capacitor as shown in Fig. 3-3
2. Oscilloscope Connection : Check pins P207 and P209 as shown in Fig. 3-4
3. Sweep Generator Center Frequency : 10.7 MHz
4. Marker Generator Frequency : 10.7 MHz
5. Band Selector : FM
6. AFC Switch : OFF
7. TONE : HIGH

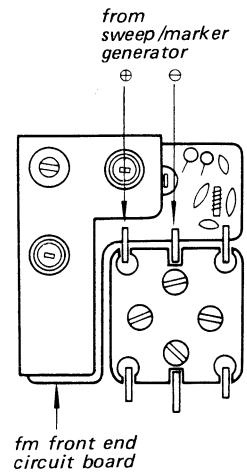


Fig. 3-3. Sweep/marker generator connection

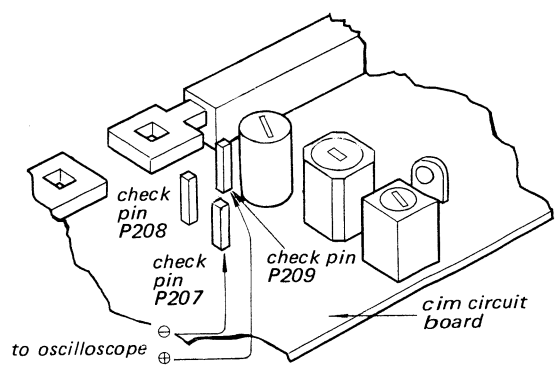


Fig. 3-4. Oscilloscope connection

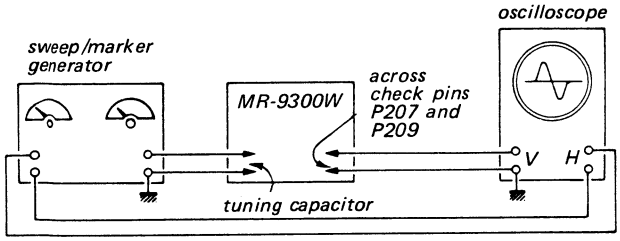


Fig. 3-5. Fm i-f alignment setup

Procedure:

1. Turn the core of discriminator transformer (IFT F204) fully counterclockwise.
2. Turn the core of fm i-f transformer (IFT F101, F201, F202) and discriminator transformer (IFT F203) to obtain the maximum amplitude response curve shown in Fig. 3-6.
3. Turn the core of discriminator transformer (IFT F204) to obtain the "S" curve response shown in Fig. 3-7.

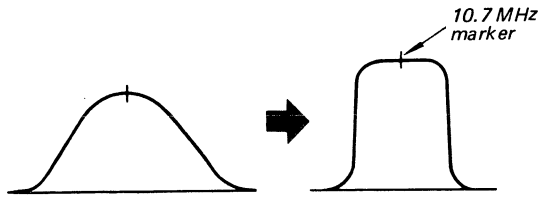


Fig. 3-6.

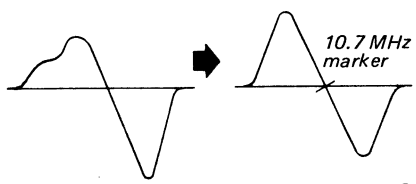


Fig. 3-7.

Sweep/Marker Generator	Oscilloscope Connection	Adjust
Coupling: Direct connection across fm tuning capacitor (osc section). See Fig. 3-3. Frequency: 10.7 MHz	Across check pins P207 and P209 shown in Fig. 3-4.	IFT F101 F201 F202 F203 F204

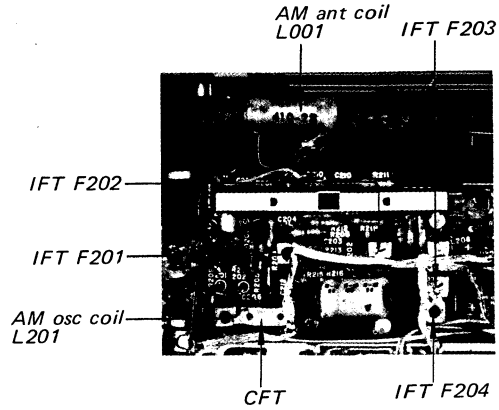


Fig. 3-8. Adjusting parts location

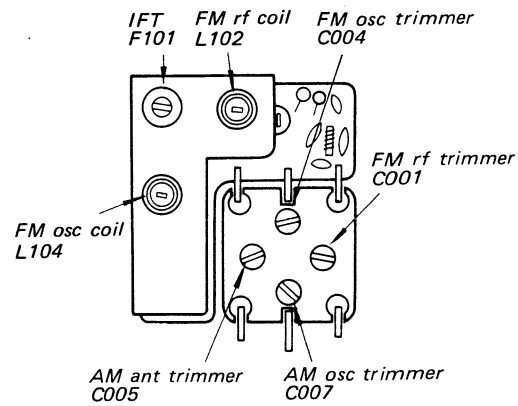


Fig. 3-9. Adjusting parts location

3-3. FREQUENCY COVERAGE AND TRACKING ADJUSTMENT

Test Equipments/Tools Required:

* Rf signal generator (for fm and a-m)
* Loop antenna
* VTVM
* Screwdriver for alignment

Preparation:

1. VTVM
   Connection : On af circuit board (See Fig. 3-10)
2. Modulation : FM... 400 Hz, ±22.5 kHz frequency modulated signal.
   AM... 1 kHz 30%-amplitude modulated signal.
3. AFC Switch: OFF
4. TONE : HIGH
5. VOL : MAX

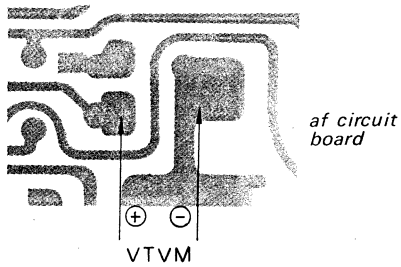


Fig. 3-10. VTVM connection

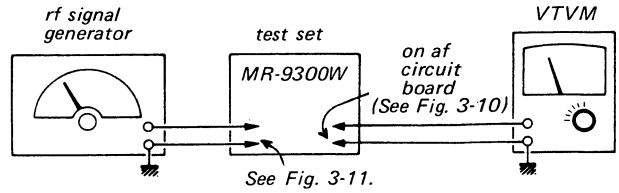


Fig. 3-12. Fm frequency coverage and tracking adjustment setup

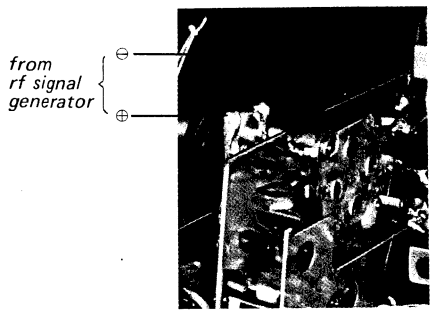


Fig. 3-11. Rf signal generator connection (fm)

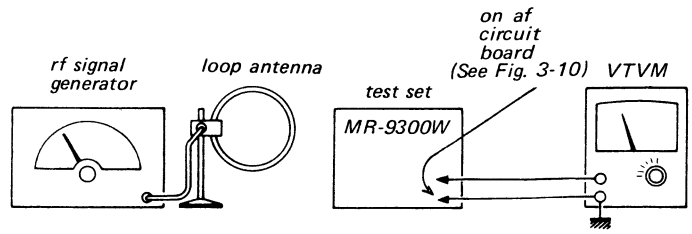


Fig. 3-13. A-m frequency coverage and tracking adjustment setup

Adjustment	Rf Signal Generator Coupling	Rf Signal Generator Frequency	Receiver Dial Setting	Adjust	Remarks
FM Frequency Coverage	Direct connection to terminals on fm front end circuit board. (See Fig. 3-11.)	86 MHz	Fully left	FM osc coil L104	Band selector: FM-MONO. Adjust for maximum meter reading.
		109.5 MHz	Fully right	FM osc trimmer C004	
FM Tracking		86 MHz	Tune to 86-MHz signal	FM rf coil L102	
		109.5 MHz	Tune to 109.5-MHz signal	FM rf trimmer C001	
AM Frequency Coverage	Loop antenna (See Fig. 3-13.)	520 kHz	Fully left	AM osc coil L201	Band selector: AM. Adjust for maximum meter reading.
		1,680 kHz	Fully right	AM osc trimmer C007	
AM Tracking		620 kHz	Tune to 620-kHz signal	AM ant coil L001	
		1,400 kHz	Tune to 1,400-kHz signal	AM ant trimmer C005	

Note: In West Germany the frequency coverage is prescribed within the range between 87.5 MHz and 108 MHz. Make the frequency coverage by adjusting osc coil (L104) and osc trimmer (C004) with the intended frequency signal from the rf signal generator.

3-4. MPX CIRCUIT ADJUSTMENT

Test Equipments/Tools Required:

* Rf Signal Generator (for fm)
* Stereo Signal Generator
* Audio Signal Generator
* VTVM
* Screwdriver for adjustment
* 8Ω resistor
* 4Ω resistor

A. 67 kHz TRAP COIL (L209), 64 kHz TRAP COIL (L213) AND SUB CHANNEL FILTER COIL (L212) ADJUSTMENT

This adjustment has a influence on the stereo separation and the tone quality. Adjust L209, L212, and L213 exactly with the test equipment after adjusting the front end and i-f section.

Preparation:

1. Rf Signal Generator (for fm)
   Frequency : 98 MHz
   Output Level : 45 ~ 80 dB
2. Band Selector : FM-ST
3. AFC Switch : ON
4. VOL : Fully counterclockwise
5. Tuning Knob : Tune to 98 MHz signal
6. Rf Signal Generator Connection:
   Terminal of FM EXT ANT as shown in Fig. 3-14.
7. Audio Signal Modulation:
   ±22.5 kHz (30%) fm modulation

Stereo Signal Generator	Audio Signal Generator Frequency	VTVM Connection	Adjust	Remarks
Main Channel: On Sub Channel: Off Pilot Signal: Off	67 kHz	Ⓐ shown in Fig. 3-15	L209 (See Fig. 3-18)	Adjust for minimum meter reading.
	64 kHz	Ⓑ shown in Fig. 3-15	L213 (See Fig. 3-18)	
Main Channel: On Sub Channel: On Pilot Signal: On	400 Hz	Ⓑ shown in Fig. 3-15	L212 (See Fig. 3-18)	Adjust for minimum meter reading.

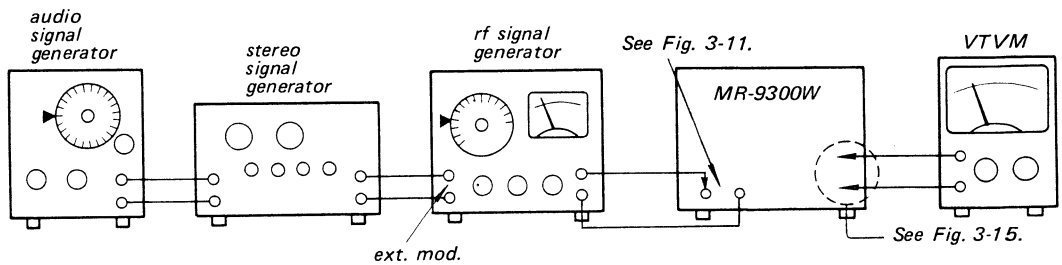


Fig. 3-14. Trap coil adjustment setup

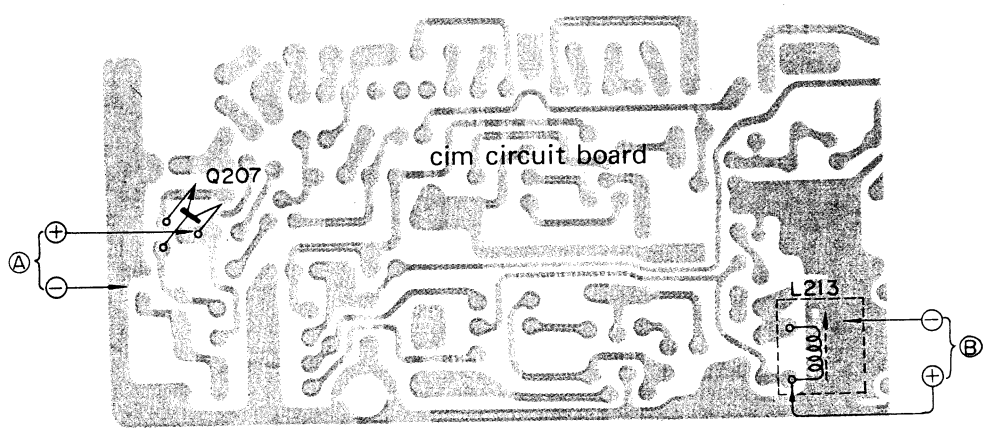


Fig. 3-15. VTVM connection

B. MS RATIO ADJUSTMENT

MS ratio adjustment is that of channel separation and has a great influence on the spread of stereophonic sound. Make this adjustment with proper equipments, only after adjusting trap coils.

Preparation:

1. Band Selector : FM-ST
2. VOL : MAX
3. TONE : HIGH
4. AFC Switch : ON
5. Tuning Knob : Tune to 98 MHz signal
6. Solder 4Ω-resistor and 8Ω-resistor as shown in Fig. 3-17.

Procedure:

1. Tune to 98 MHz signal for maximum VTVM ① reading.
2. Turn the VOLUME control knob so that the VTVM ① reading is 0.25 V.
3. Adjust the semi-fixed resistor R266 so that the VTVM ② reading is 0.45 V.

Audio Signal Generator	Stereo Signal Generator	Rf Signal Generator	VTVM Connection	Adjust
400 Hz	Main Channel: On Sub Channel: On Pilot Signal: On Pre-emphasis: On	Frequency: 98 MHz Output Level: 54 dB Connection: Terminals on fm front end circuit board as shown in Fig. 3-11.	VTVM 1: Ⓓ shown in Fig. 3-17. VTVM 2: Ⓔ shown in Fig. 3-17.	R266 (See Fig. 3-18)

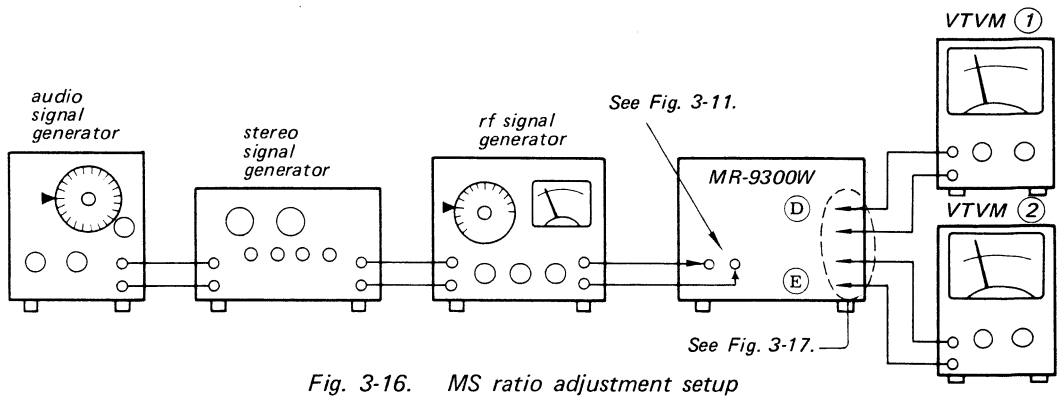


Fig. 3-16. MS ratio adjustment setup

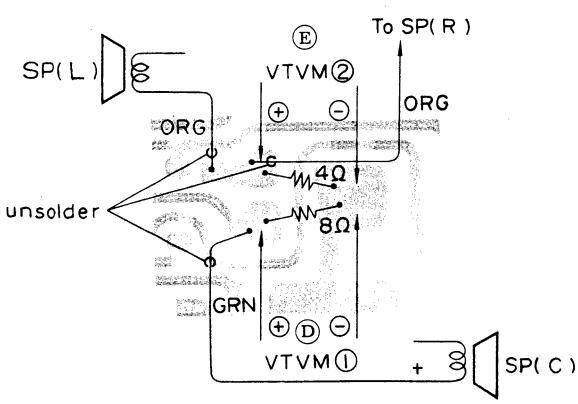


Fig. 3-17. VTVM connection

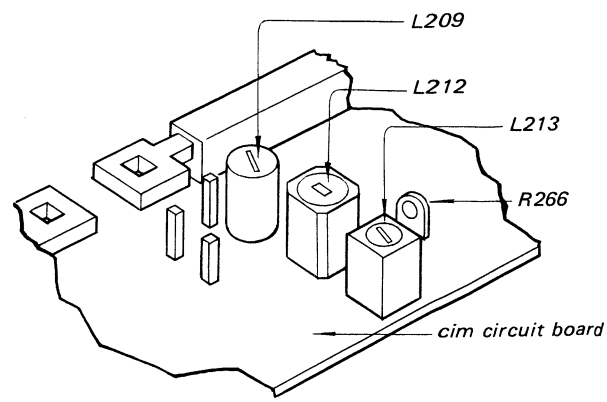


Fig. 3-18. Adjusting parts location

3-5. BIAS ADJUSTMENT

A. Agc (Automatic Gain Control) Adjustment

Preparation:

1. Connect a 0.2μF ceramic capacitor across emitter and collector of transistor Q201 as shown in Fig. 3-19.
2. Set the band selector to AM.

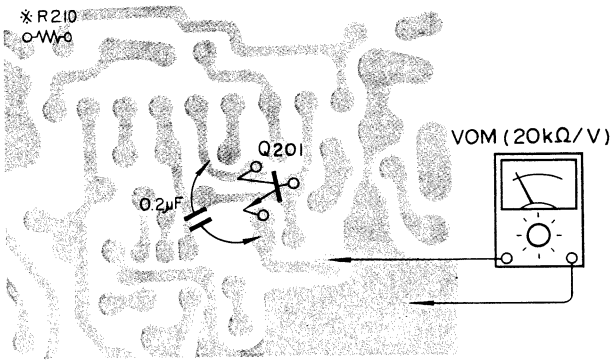


Fig. 3-19.

Adjustment:

1. Select the value of R210 so that the emitter voltage of Q201 is 0.3～0.35 volts with a VOM (20kΩ/V).

Ref. No.	Part No.	Description
R210 (See Fig. 3-19)	1-244-710	36kΩ ¼W carbon
	1-244-711	39kΩ ¼W carbon
	1-244-712	43kΩ ¼W carbon
	1-244-713	47kΩ ¼W carbon
	1-244-714	51kΩ ¼W carbon

2. After selecting R210, remove the 0.2μF ceramic capacitor.

B. I-f Current Adjustment

Select the value of R267 so that the emitter voltage of Q202 is 0.7V ±0.05V in FM band with a VTVM.

R267	1-244-673	1kΩ
	1-244-676	1.3kΩ
	1-244-679	1.8kΩ
	1-244-682	2.4kΩ
	1-244-685	3.3kΩ
	1-244-688	4.3kΩ

C. Stereo Range Adjustment

Select the value of R303 and R304 so that the emitter voltage of Q301 and Q302 is 0.025V with a VTVM.

R303 R304	1-244-717	68kΩ
	1-244-725	150kΩ
	1-244-729	220kΩ
	1-244-732	300kΩ

MEMO

3-5. BIAS ADJUSTMENT

A. Agc (Automatic Gain Control) Adjustment

Preparation:

1. Connect a 0.2μF ceramic capacitor across emitter and collector of transistor Q201 as shown in Fig. 3-19.
2. Set the band selector to AM.

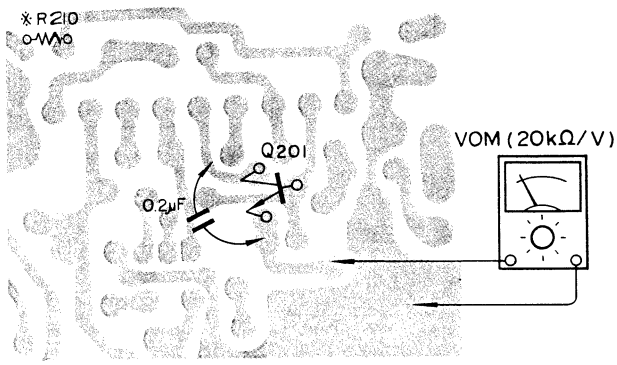


Fig. 3-19.

Adjustment:

1. Select the value of R210 so that the emitter voltage of Q201 is 0.3～0.35 volts with a VOM (20kΩ/V).

Ref. No.	Part No.	Description
R210 (See Fig. 3-19)	1-244-710	36 kΩ ¼W carbon
	1-244-711	39 kΩ ¼W carbon
	1-244-712	43 kΩ ¼W carbon
	1-244-713	47 kΩ ¼W carbon
	1-244-714	51 kΩ ¼W carbon

2. After selecting R210, remove the 0.2μF ceramic capacitor.

B. I-f Current Adjustment

Select the value of R267 so that the emitter voltage of Q202 is 0.7V ±0.05V in FM band with a VTVM.

R267	1-244-673	1 kΩ
	1-244-676	1.3 kΩ
	1-244-679	1.8 kΩ
	1-244-682	2.4 kΩ
	1-244-685	3.3 kΩ
	1-244-688	4.3 kΩ

C. Stereo Range Adjustment

Select the value of R303 and R304 so that the emitter voltage of Q301 and Q302 is 0.025V with a VTVM.

R303 R304	1-244-717	68 kΩ
	1-244-725	150 kΩ
	1-244-729	220 kΩ
	1-244-732	300 kΩ

MEMO

3-5. BIAS ADJUSTMENT

A. Agc (Automatic Gain Control) Adjustment

Preparation:

1. Connect a 0.2μF ceramic capacitor across emitter and collector of transistor Q201 as shown in Fig. 3-19.
2. Set the band selector to AM.

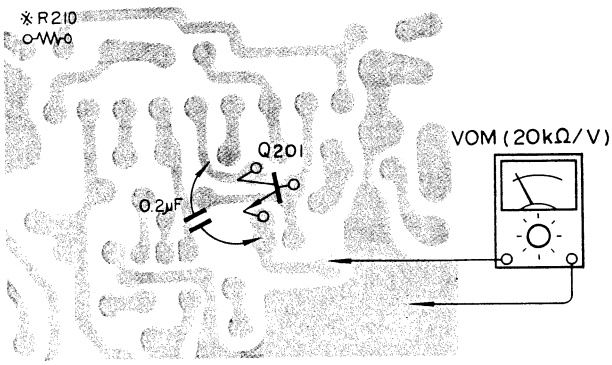


Fig. 3-19.

Adjustment:

1. Select the value of R210 so that the emitter voltage of Q201 is 0.3～0.35 volts with a VOM (20kΩ/V).

Ref. No.	Part No.	Description
R210 (See Fig. 3-19)	1-244-710	36kΩ ¼W carbon
	1-244-711	39kΩ ¼W carbon
	1-244-712	43kΩ ¼W carbon
	1-244-713	47kΩ ¼W carbon
	1-244-714	51kΩ ¼W carbon

2. After selecting R210, remove the 0.2μF ceramic capacitor.

B. I-f Current Adjustment

Select the value of R267 so that the emitter voltage of Q202 is 0.7V ±0.05V in FM band with a VTVM.

R267	1-244-673	1kΩ
	1-244-676	1.3kΩ
	1-244-679	1.8kΩ
	1-244-682	2.4kΩ
	1-244-685	3.3kΩ
	1-244-688	4.3kΩ

C. Stereo Range Adjustment

Select the value of R303 and R304 so that the emitter voltage of Q301 and Q302 is 0.025V with a VTVM.

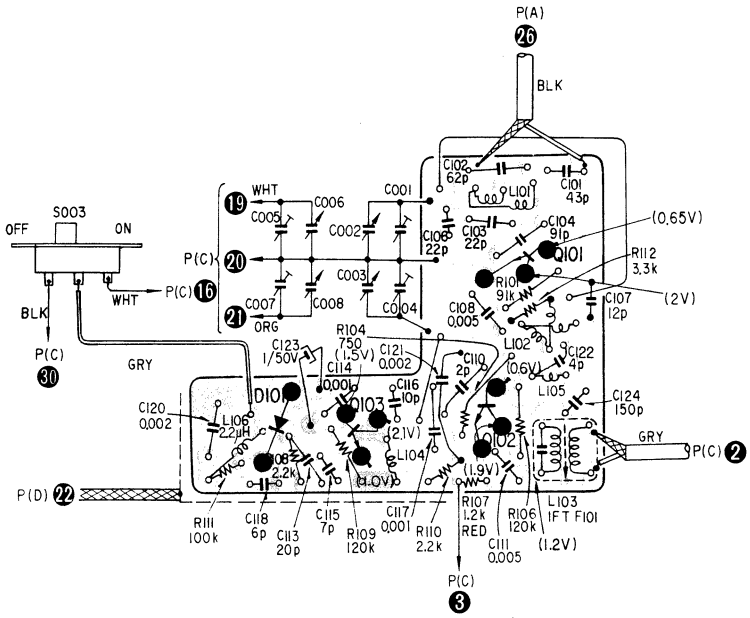
R303 R304	1-244-717	68kΩ
	1-244-725	150kΩ
	1-244-729	220kΩ
	1-244-732	300kΩ

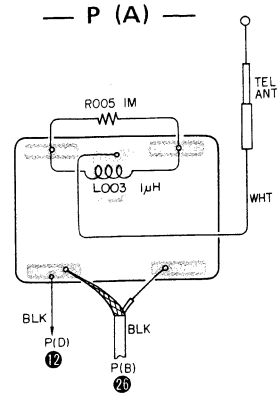
MEMO

SECTION 4
MOUNTING AND SCHEMATIC DIAGRAMS

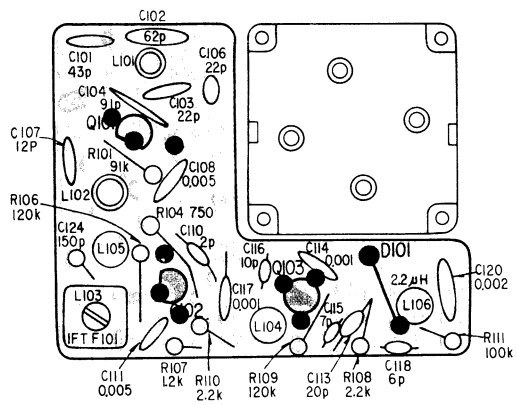
4-1. FM FRONT END CIRCUIT BOARD – P (B) –

– Conductor Side –





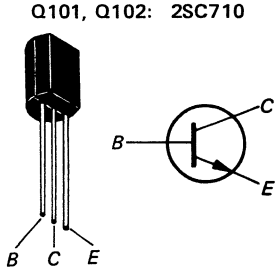
– Component Side –



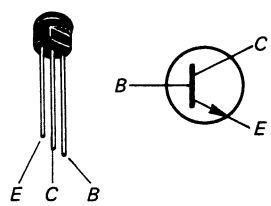
C107, C112, C123, R112 conductor side parts.

Printed circuit board, Part No. 1-539-615-14

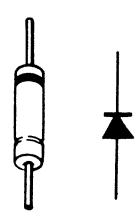
Q101, Q102: 2SC710



Q103: 2SC930

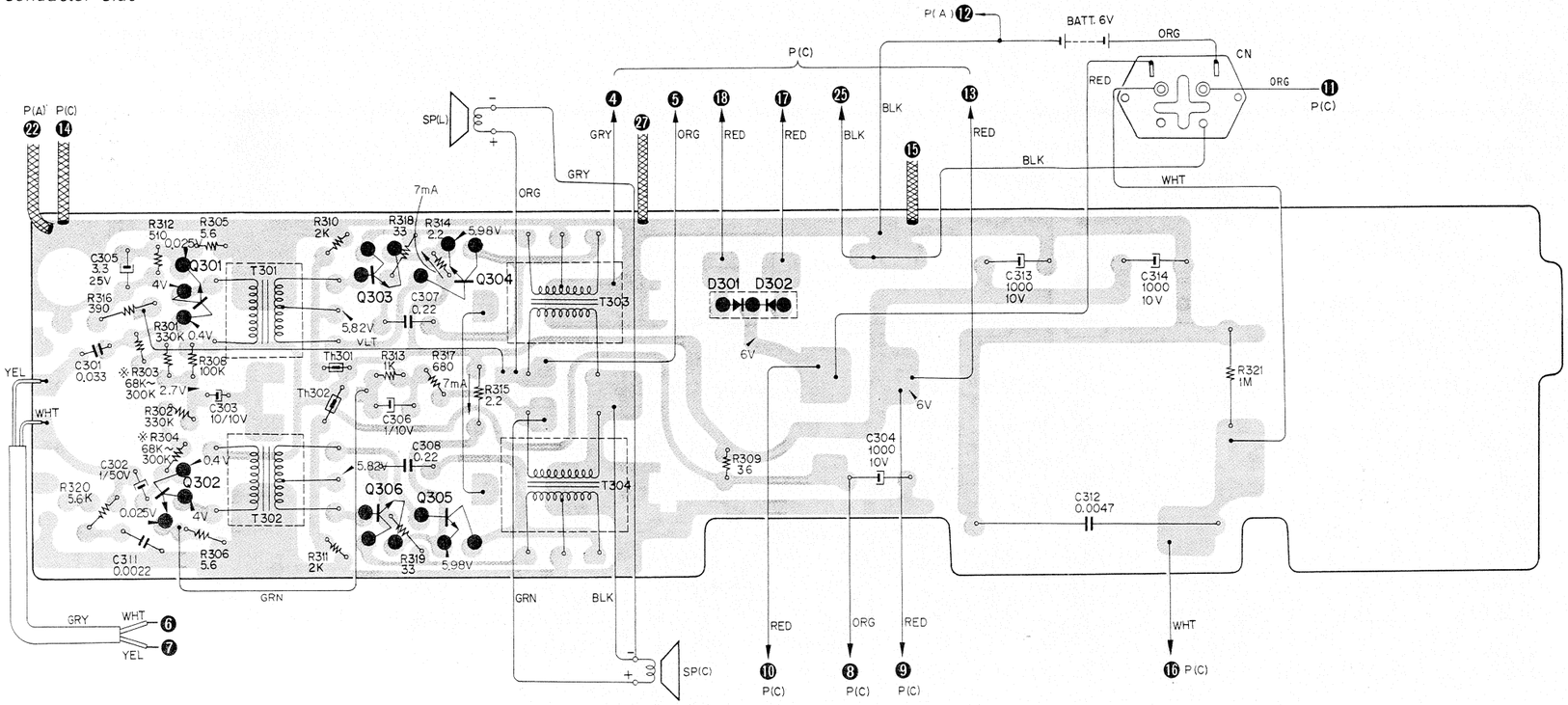


D101: 1S351M

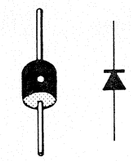


4-2. AF CIRCUIT BOARD — P (D) —

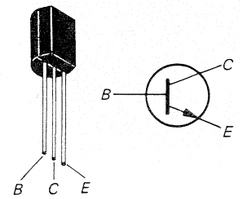
– Conductor Side –



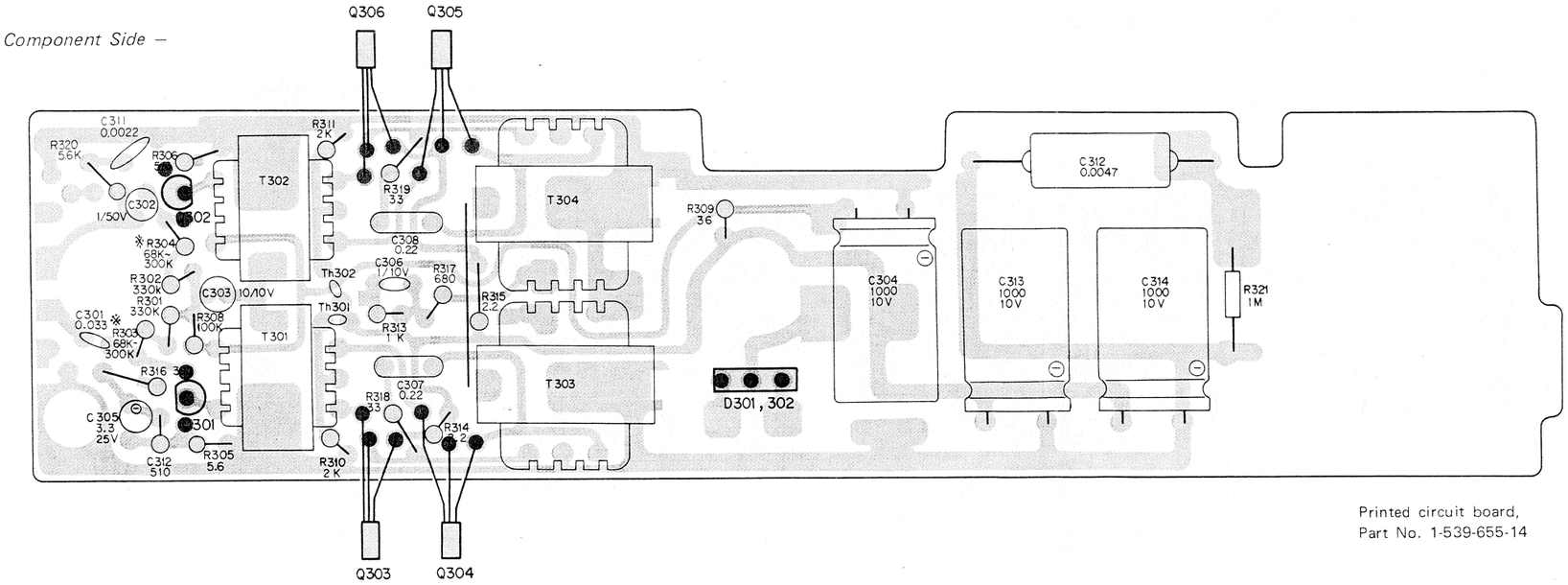
D301, D302: CD-2



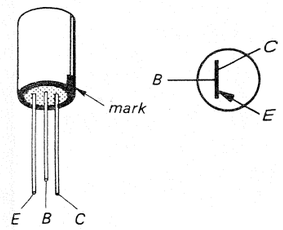
Q301, Q302: 2SC870



– Component Side –



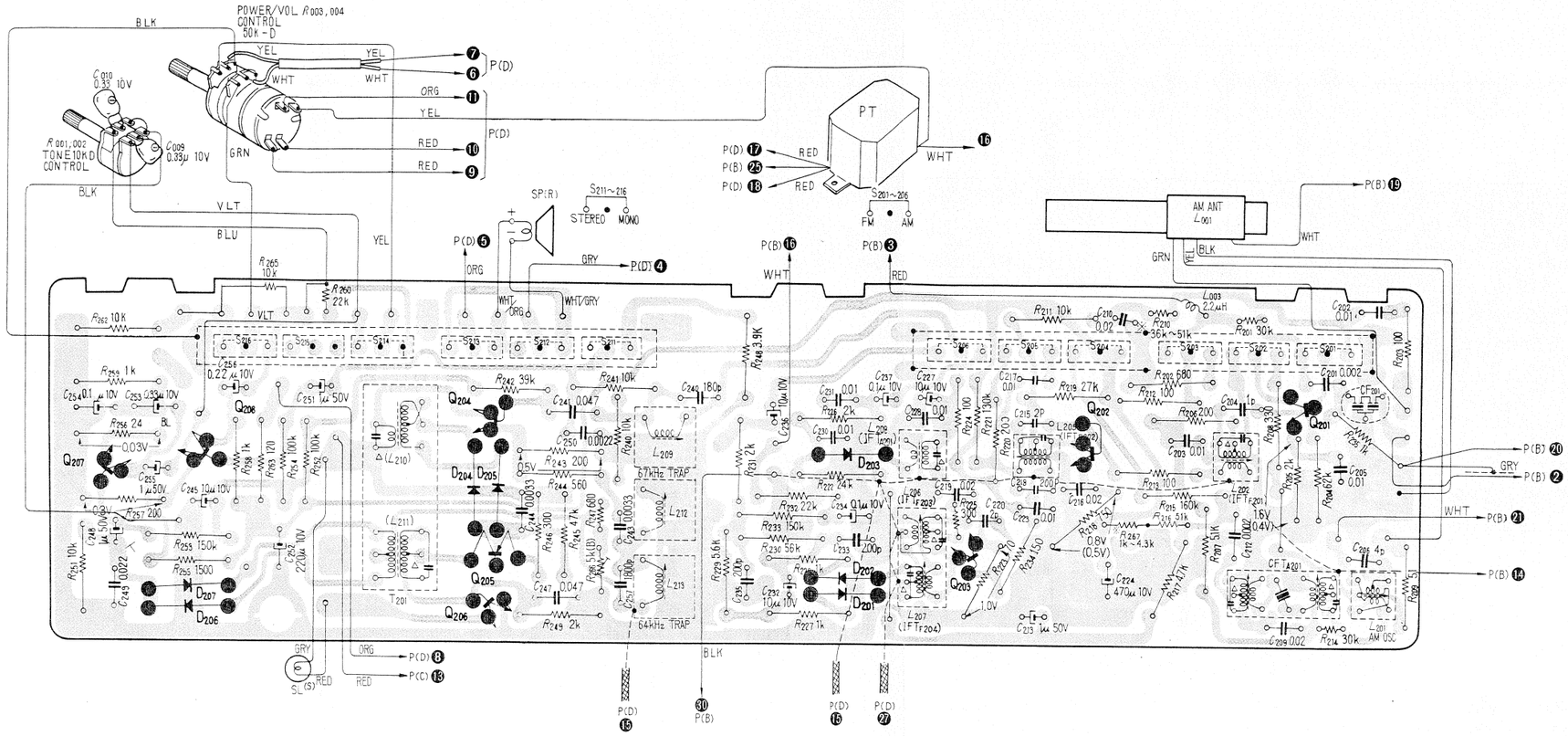
Q303 ~ Q306: 2SB495



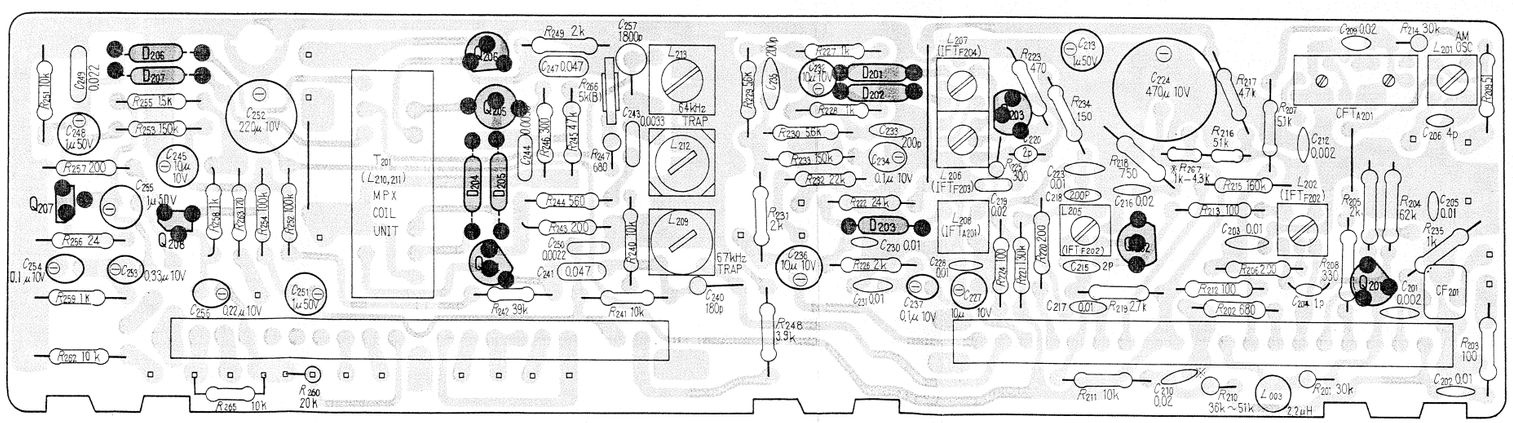
Printed circuit board,
Part No. 1-539-655-14

4-3. CIM CIRCUIT BOARD — P (C) —

— Conductor Side —



— Component Side —

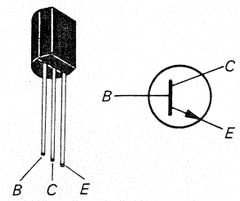


Note:

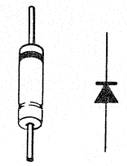
1. S201 — S206 is band selector;
   FM AM
   S211 — S216 is FM · FM ST selector; STEREO MONO
2. C253, C254 and R259 have a great influence on the stereo separation and the tone quality. Make sure the value of parts when you change these parts.

Printed circuit board,
Part No. 1-539-906-11

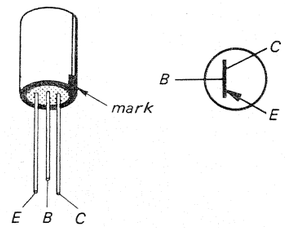
Q201 ~ Q203: 2SC710
Q204, Q206 : 2SC870



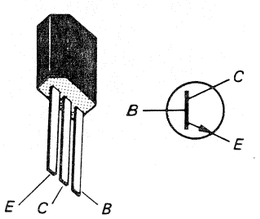
D201, D202: 1T261
D204, D205: 1T262
D203 : 1T23
D206, D207: 1T22



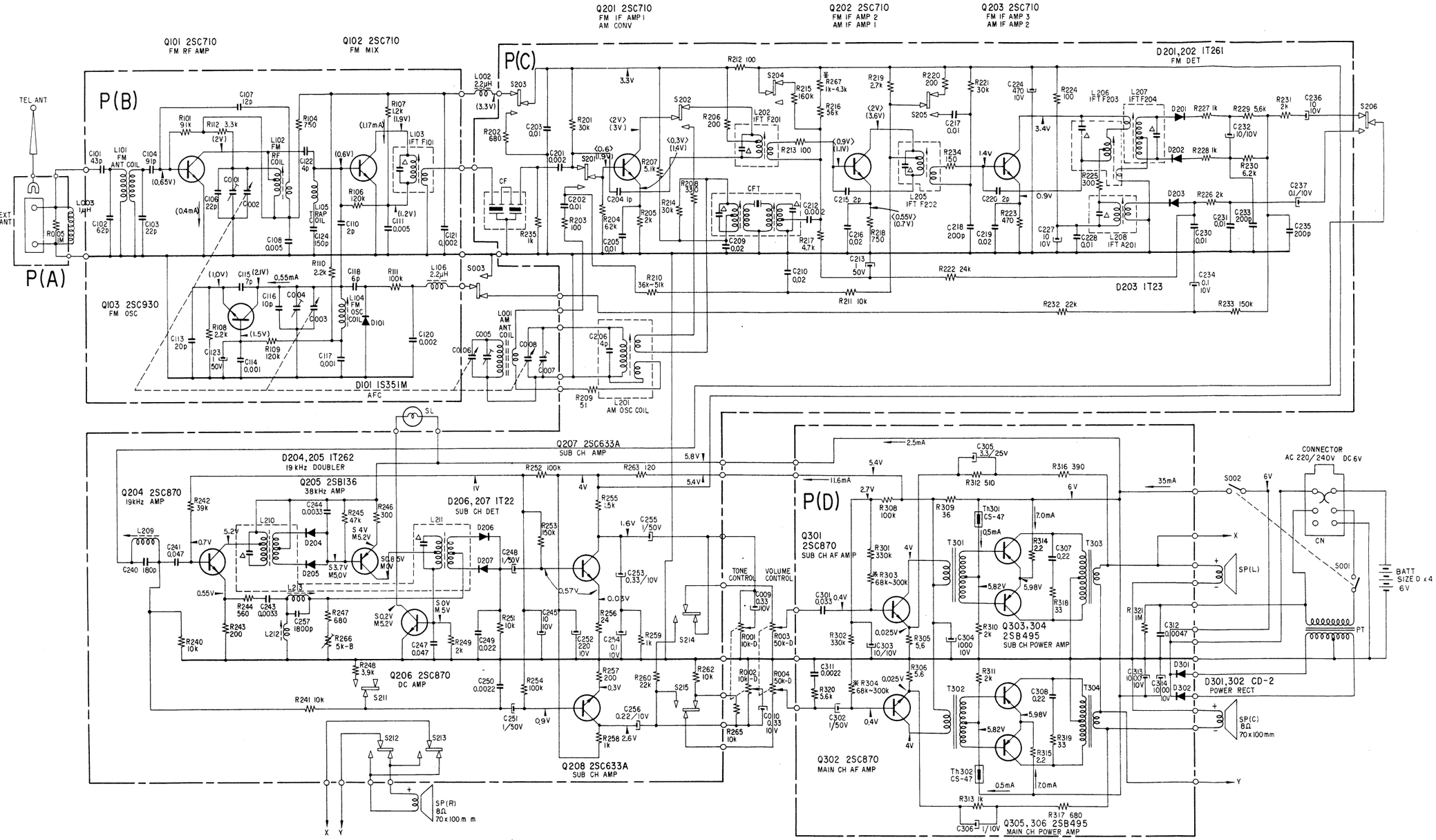
Q205: 2SB136



Q207, Q208: 2SC633A



4-4. SCHEMATIC DIAGRAM



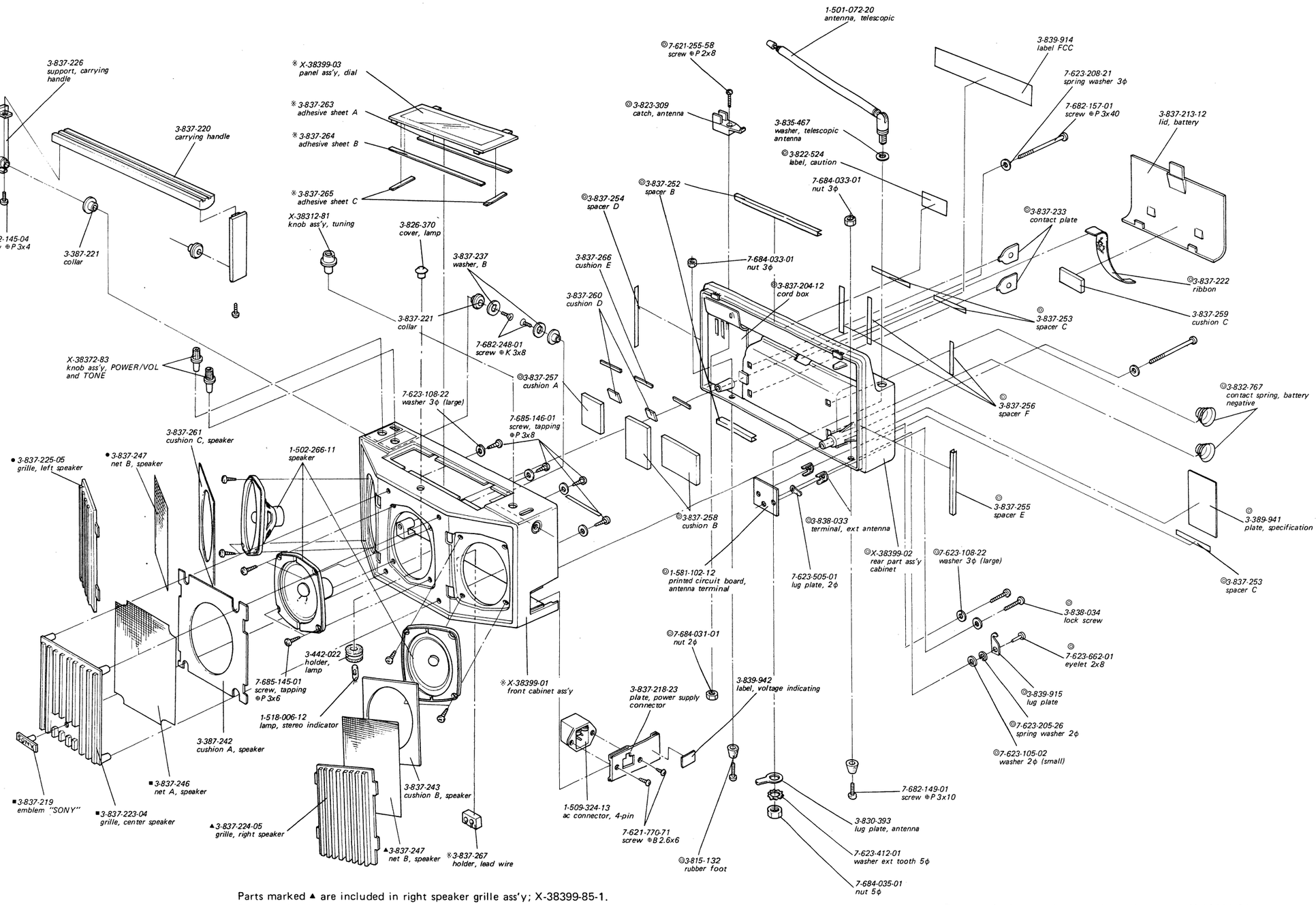
Note:

1. All resistors and capacitors are in Ω and μF unless otherwise specified.
2. Capacitors marked △ are built-in i-f transformers.
3. The symbol ※ indicates a component whose value is selected to yield normal operating condition.
4. Voltage values are measured from point indicated to ground circuit with a dc voltmeter (VTVM) and current values are measured with a dc ammeter. Voltage and current are measured with no radio signal received. Variations may be noted due to normal production tolerances. The values in < > are measured with band selector AM and in ( ) with FM. The symbol M shows the value with FM(MONO) and S with FM-ST(STEREO).
5. S201 – S206 : band selector (position FM)
   S211 – S216 : FM - FMST selector (position FMST)
   S003 : AFC switch (position ON)
6. CF: When replacing ceramic filter, use one whose identification color is the same as the used one.

Part No.	Identification Color (Color of Component)
1-527-501-11	red
1-527-501-12	blue
1-527-501-13	orange

SECTION 5
EXPLODED VIEW AND PACKING

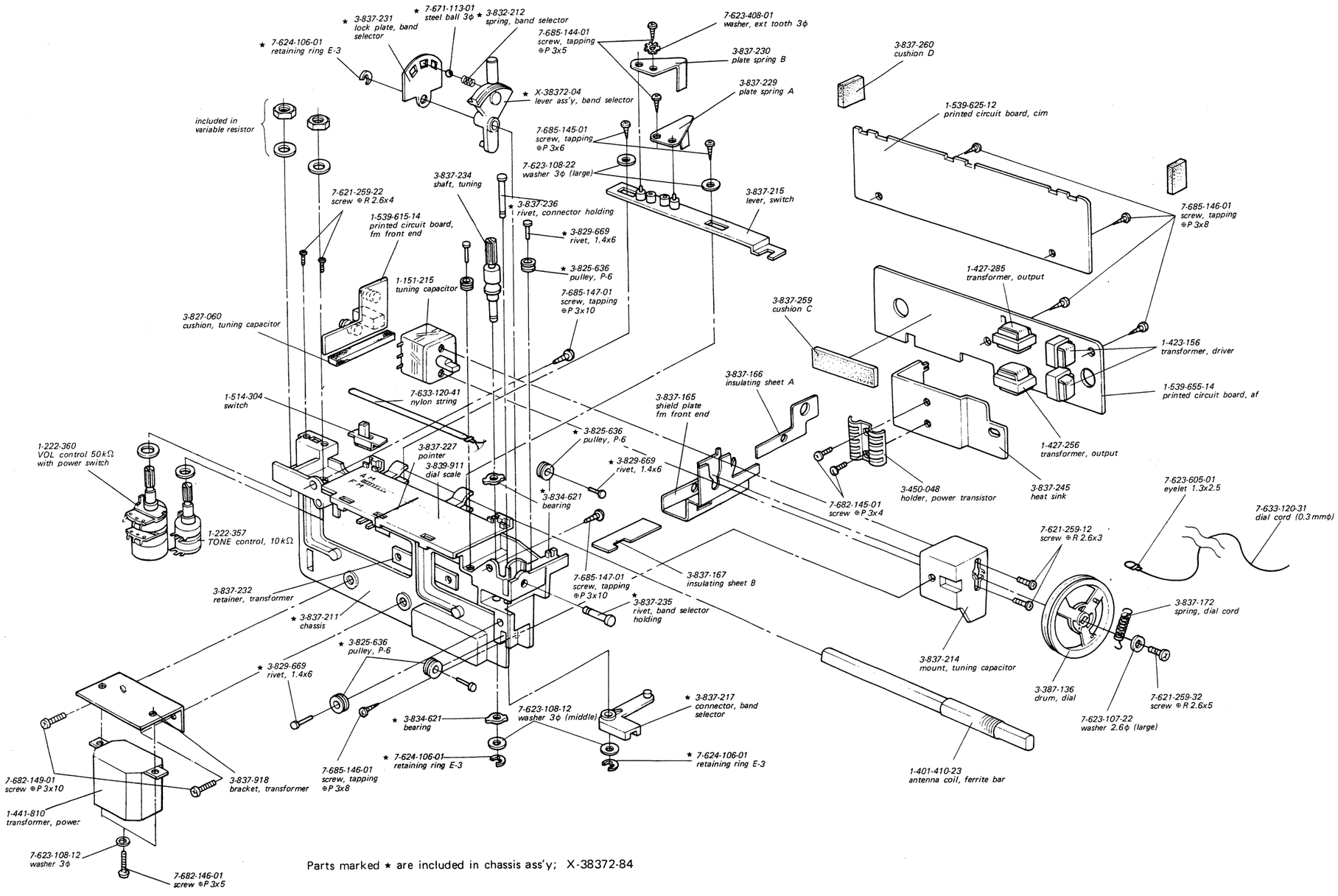
5-1. EXPLODED VIEW (1)


3-837-226 support, carrying handle
3-837-220 carrying handle
7-682-145-04 screw ⊕P 3x4
3-387-221 collar
※ X-38399-03 panel ass'y, dial
※ 3-837-263 adhesive sheet A
※ 3-837-264 adhesive sheet B
※ 3-837-265 adhesive sheet C
X-38312-81 knob ass'y, tuning
3-826-370 cover, lamp
3-837-237 washer, B
3-837-221 collar
7-682-248-01 screw ⊕K 3x8
X-38372-83 knob ass'y, POWER/VOL and TONE
◎3-837-257 cushion A
7-623-108-22 washer 3φ (large)
7-685-146-01 screw, tapping ⊕P 3x8
3-837-261 cushion C, speaker
1-502-266-11 speaker
● 3-837-225-05 grille, left speaker
● 3-837-247 net B, speaker
3-442-022 holder, lamp
7-685-145-01 screw, tapping ⊕P 3x6
1-518-006-12 lamp, stereo indicator
3-387-242 cushion A, speaker
■ 3-837-246 net A, speaker
■ 3-837-219 emblem "SONY"
■ 3-837-223-04 grille, center speaker
▲ 3-837-224-05 grille, right speaker
▲ 3-837-247 net B, speaker
※ 3-837-267 holder, lead wire
3-837-243 cushion B, speaker
※ X-38399-01 front cabinet ass'y
1-501-072-20 antenna, telescopic
◎ 7-621-255-58 screw ⊕P 2x8
◎ 3-823-309 catch, antenna
3-835-467 washer, telescopic antenna
◎ 3-822-524 label, caution
◎ 3-837-252 spacer B
◎ 3-837-254 spacer D
3-837-266 cushion E
3-837-260 cushion D
7-684-033-01 nut 3φ
◎ 3-837-204-12 cord box
◎ 3-837-258 cushion B
◎ 1-581-102-12 printed circuit board, antenna terminal
3-837-218-23 plate, power supply connector
1-509-324-13 ac connector, 4-pin
7-621-770-71 screw ⊕B 2.6x6
◎ 3-815-132 rubber foot
3-839-942 label, voltage indicating
◎ 3-838-033 terminal, ext antenna
7-623-505-01 lug plate, 2φ
◎ X-38399-02 rear part ass'y cabinet
◎ 7-684-031-01 nut 2φ
3-839-914 label FCC
7-623-208-21 spring washer 3φ
7-682-157-01 screw ⊕P 3x40
3-837-213-12 lid, battery
◎ 3-837-233 contact plate
◎ 3-837-222 ribbon
◎ 3-837-253 spacer C
3-837-259 cushion C
◎ 3-837-256 spacer F
◎ 3-837-255 spacer E
◎ 3-832-767 contact spring, battery negative
◎ 3-389-941 plate, specification
◎ 3-837-253 spacer C
◎ 7-623-108-22 washer 3φ (large)
◎ 3-838-034 lock screw
◎ 7-623-662-01 eyelet 2x8
◎ 3-839-915 lug plate
◎ 7-623-205-26 spring washer 2φ
◎ 7-623-105-02 washer 2φ (small)
7-682-149-01 screw ⊕P 3x10
3-830-393 lug plate, antenna
7-623-412-01 washer ext tooth 5φ
7-684-035-01 nut 5φ

Parts marked ▲ are included in right speaker grille ass'y; X-38399-85-1.
Parts marked ■ are included in center speaker grille ass'y; X-38399-86-1.
Parts marked ● are included in left speaker grille ass'y; X-38399-84-1.

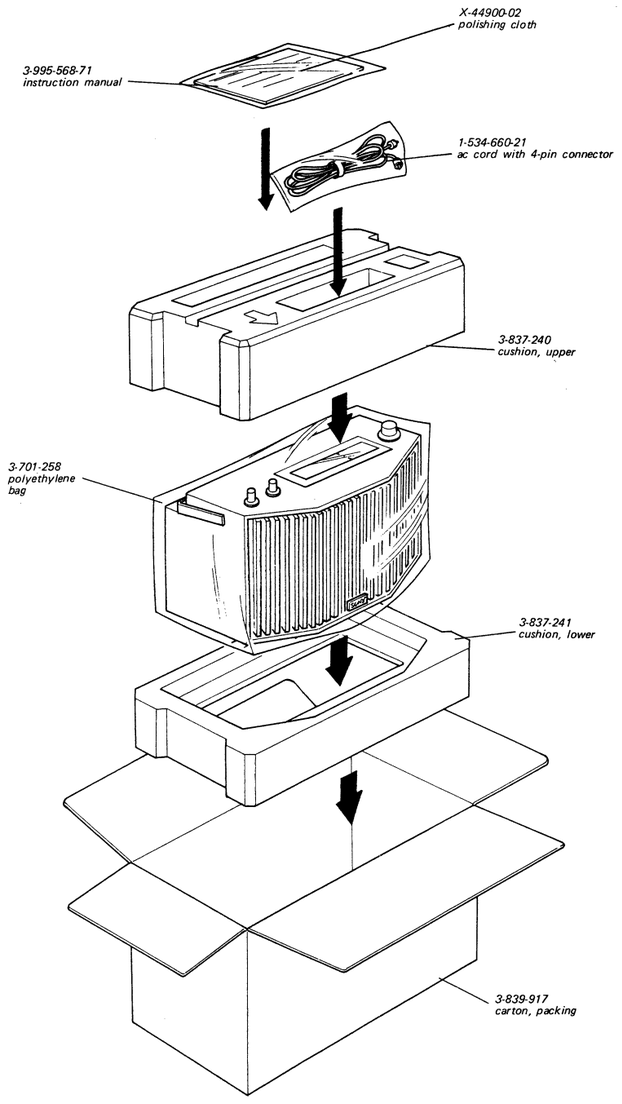
Parts marked ※ are included in cabinet ass'y; X-38399-82-1.
Parts marked ◎ are included in rear cabinet ass'y; X-38399-83-1.

5-2. EXPLODED VIEW (2)


★ 7-671-113-01 steel ball 3φ
★ 3-832-212 spring, band selector
★ 3-837-231 lock plate, band selector
★ 7-624-106-01 retaining ring E-3
7-685-144-01 screw, tapping ⊕P 3x5
7-623-408-01 washer, ext tooth 3φ
3-837-230 plate spring B
3-837-229 plate spring A
★ X-38372-04 lever ass'y, band selector
included in variable resistor
7-685-145-01 screw, tapping ⊕P 3x6
7-623-108-22 washer 3φ (large)
3-837-234 shaft, tuning
3-837-215 lever, switch
★ 3-837-236 rivet, connector holding
7-621-259-22 screw ⊕R 2.6x4
1-539-615-14 printed circuit board, fm front end
★ 3-829-669 rivet, 1.4x6
★ 3-825-636 pulley, P-6
1-151-215 tuning capacitor
7-685-147-01 screw, tapping ⊕P 3x10
3-827-060 cushion, tuning capacitor
1-514-304 switch
7-633-120-41 nylon string
3-837-165 shield plate fm front end
3-837-166 insulating sheet A
3-837-260 cushion D
1-539-625-12 printed circuit board, cim
7-685-146-01 screw, tapping ⊕P 3x8
1-427-285 transformer, output
3-837-259 cushion C
1-423-156 transformer, driver
1-539-655-14 printed circuit board, af
1-427-256 transformer, output
3-450-048 holder, power transistor
3-837-245 heat sink
7-682-145-01 screw ⊕P 3x4
7-623-605-01 eyelet 1.3x2.5
7-633-120-31 dial cord (0.3 mmφ)
1-222-360 VOL control 50kΩ with power switch
3-839-911 dial scale
3-837-227 pointer
★ 3-829-669 rivet, 1.4x6
★ 3-825-636 pulley, P-6
★ 3-834-621 bearing
1-222-357 TONE control, 10kΩ
7-621-259-12 screw ⊕R 2.6x3
3-837-167 insulating sheet B
7-685-147-01 screw, tapping ⊕P 3x10
3-837-172 spring, dial cord
3-837-232 retainer, transformer
★ 3-837-235 rivet, band selector holding
★ 3-837-211 chassis
★ 3-825-636 pulley, P-6
3-837-214 mount, tuning capacitor
3-387-136 drum, dial
7-621-259-32 screw ⊕R 2.6x5
7-623-107-22 washer 2.6φ (large)
★ 3-829-669 rivet, 1.4x6
★ 3-834-621 bearing
7-623-108-12 washer 3φ (middle)
★ 3-837-217 connector, band selector
★ 7-624-106-01 retaining ring E-3
★ 7-624-106-01 retaining ring E-3
7-685-146-01 screw, tapping ⊕P 3x8
3-837-918 bracket, transformer
7-682-149-01 screw ⊕P 3x10
1-441-810 transformer, power
7-623-108-12 washer 3φ
7-682-146-01 screw ⊕P 3x5
1-401-410-23 antenna coil, ferrite bar

Parts marked ★ are included in chassis ass'y; X-38372-84

5-3. PACKING



SECTION 6
ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description
		SEMICONDUCTORS
Q101		transistor 2SC710
Q102		transistor 2SC710
Q103		transistor 2SC930
Q201		transistor 2SC710
Q202		transistor 2SC710
Q203		transistor 2SC710
Q204		transistor 2SC870
Q205		transistor 2SB136
Q206		transistor 2SC870
Q207		transistor 2SC633A
Q208		transistor 2SC633A
Q301		transistor 2SC870
Q302		transistor 2SC870
Q303		transistor 2SB495
Q304		transistor 2SB495
Q305		transistor 2SB495
Q306		transistor 2SB495
D101		diode 1S351M
D201		diode 1T-261
D202		diode 1T-261
D203		diode 1T-23
D204		diode 1T-262
D205		diode 1T-262
D206		diode 1T-22
D207		diode 1T-22
D301		diode CD-2
D302		diode CD-2
Th301	8-691-002-01	thermistor CS-47
Th302	8-691-002-01	thermistor CS-47
		COILS AND TRANSFORMERS
L001	1-401-410-23	antenna coil, ferrite bar
L002	1-407-182	2.2μH, micro inductor
L003	1-407-178	1.0μH, micro inductor
L101	1-425-449	coil, fm antenna
L102	1-425-632	coil, fm rf
L103	1-403-242	transformer, fm i-f (IFT F101)
L104	1-405-463	coil, fm osc
L105	1-407-182	2.2μH, micro inductor
L106	1-407-182	2.2μH, micro inductor
L201	1-405-417	coil, a-m osc
L202	1-403-244-31	transformer, fm i-f (IFT F201)
L203		– discarded –
L204		– discarded –
L205	1-403-244-31	transformer, fm i-f (IFT F202)
L206	1-403-272-31	transformer, discriminator (IFT F203)
L207	1-403-273-31	transformer, discriminator (IFT F204)
L208	1-403-137-11	transformer, a-m i-f (IFT A201)
L209	1-409-201	trap coil, SCA
L210, 211	1-425-633	coil, unit, mpx
L212	1-425-635	filter coil, sub channel
L213	1-425-634	trap coil, 64 kHz
CF	1-527-501-11	ceramic filter (RED)
	1-527-501-12	ceramic filter (BLU)
	1-527-501-13	ceramic filter (ORG)
CFT	1-403-144	ceramic filter, a-m i-f
T301	1-423-156	transformer, driver
T302	1-423-156	transformer, driver
T303	1-427-256	transformer, output
T304	1-427-285	transformer, output (center speaker)
PT	1-441-810	transformer, power
		CAPACITORS
C001～C008	1-151-215	tuning capacitor, 4-gang
C009	1-127-021-11	0.33μF 10V electrolytic (alox)
C010	1-127-021-11	0.33μF 10V electrolytic (alox)
C101	1-102-966	43pF ceramic
C102	1-101-886	62pF ceramic
C103	1-102-959	22pF ceramic
C104	1-102-972	91pF ceramic
C105		– discarded –
C106	1-102-959	22pF ceramic
C107	1-102-949	12pF ceramic
C108	1-101-922	0.005μF ceramic
C109		– discarded –
C110	1-102-939	2pF ceramic
C111	1-101-922	0.005μF ceramic
C112		– discarded –
C113	1-102-958	20pF ceramic
C114	1-101-922	0.001μF ceramic
C115	1-102-944	7pF ceramic
C116	1-102-947	10pF ceramic
C117	1-105-821-12	0.001μF mylar
C118	1-102-943	6pF ceramic
C119		– discarded –
C120	1-101-919	0.002μF ceramic
C121	1-101-919	0.002μF ceramic
C122	1-102-941	4pF ceramic
C123	1-121-391	1μF 50V electrolytic
C124	1-103-655	150pF styrol
C201	1-101-919	0.002μF ceramic
C202	1-101-923	0.01μF ceramic
C203	1-101-923	0.01μF ceramic
C204	1-102-938	1pF ceramic
C205	1-105-833-15	0.01μF mylar
C206	1-102-937	4pF ceramic
C207		– discarded –

Ref. No.	Part No.	Description
C208		– discarded –
C209	1-101-924	0.02μF ceramic
C210	1-101-924	0.02μF ceramic
C211		– discarded –
C212	1-101-919	0.002μF ceramic
C213	1-121-391	1μF 50V electrolytic
C214		– discarded –
C215	1-102-939	2pF ceramic
C216	1-101-924	0.02μF ceramic
C217	1-101-923	0.01μF ceramic
C218	1-107-138	200pF silvered mica
C219	1-105-837-12	0.022μF mylar
C220	1-102-939	2pF ceramic
C221		– discarded –
C222		– discarded –
C223		– discarded –
C224	1-121-425	470μF 10V electrolytic
C225		– discarded –
C226		– discarded –
C227	1-121-469	10μF 10V electrolytic
C228	1-101-923	0.01μF ceramic
C229		– discarded –
C230	1-105-833-12	0.01μF mylar
C231	1-101-923	0.01μF ceramic
C232	1-121-469	10μF 10V electrolytic
C233	1-107-138	200pF silvered mica
C234	1-127-019	0.1μF 10V electrolytic (alox)
C235	1-107-138	200pF silvered mica
C236	1-121-469	10μF 10V electrolytic
C237	1-127-019	0.1μF 10V electrolytic (alox)
C238		– discarded –
C239		– discarded –
C240	1-107-137	180pF silvered mica
C241	1-105-841-12	0.047μF mylar
C242		– discarded –
C243	1-105-827-12	0.0033μF mylar
C244	1-105-667-12	0.0033μF mylar
C245	1-121-469	10μF 10V electrolytic
C246		– discarded –
C247	1-105-841-12	0.047μF mylar
C248	1-121-391	1μF 50V electrolytic
C249	1-105-677-12	0.022μF mylar
C250	1-105-825-12	0.0022μF mylar
C251	1-121-391	1μF 50V electrolytic
C252	1-121-420	220μF 10V electrolytic
C253	1-127-021	0.33μF 10V electrolytic (alox)
C254	1-127-019	0.1μF 10V electrolytic (alox)
C255	1-121-391	1μF 50V electrolytic
C256	1-127-020	0.22μF 10V electrolytic (alox)
C301	1-105-839-12	0.033μF mylar
C302	1-121-391	1μF 50V electrolytic
C303	1-121-469	10μF 10V electrolytic
C304	1-121-736	1,000μF 10V electrolytic
C305	1-121-392	3.3μF 25V electrolytic
C306	1-127-023	1μF 10V electrolytic (alox)
C307	1-108-293-12	0.22μF mylar
C308	1-108-293-12	0.22μF mylar
C309		– discarded –
C310		– discarded –
C311	1-105-825-12	0.0022μF mylar
C312	1-115-071	0.0047μF 600V paper
C313	1-121-736	1,000μF 10V electrolytic
C314	1-121-736	1,000μF 10V electrolytic

RESISTORS

All resistors are ¼W, ±5% carbon type resistors unless otherwise noted.

R001, R002	1-222-357	TONE control, 10 kΩ-D
R003, R004	1-222-360-22	VOL control, 50 kΩ-D with power switch
R005	1-202-645	1 MΩ ½W composition
R101	1-244-720	91 kΩ
R102		– discarded –
R103	1-244-721	100 kΩ
R104	1-244-670	750 Ω
R105		– discarded –
R106	1-244-723	120 kΩ
R107	1-244-675	1.2 kΩ
R108	1-244-681	2.2 kΩ
R109	1-244-723	120 kΩ
R110	1-244-681	2.2 kΩ
R111	1-244-721	100 kΩ
R112	1-208-127	3.3 kΩ 1/16W ceramic
R201	1-244-708	30 kΩ
R202	1-244-669	680 Ω
R203	1-244-649	100 Ω
R204	1-244-716	68 kΩ
R205	1-244-680	2 kΩ
R206	1-244-656	200 Ω
R207	1-244-690	5.1 kΩ
R208	1-244-661	330 Ω
R209	1-244-642	51 Ω
※ R210	1-244-710	36 kΩ
	1-244-711	39 kΩ
	1-244-712	43 kΩ
	1-244-713	47 kΩ
	1-244-714	51 kΩ
R211	1-244-697	10 kΩ
R212	1-244-649	100 Ω

Ref. No.	Part No.	Description
R213	1-244-649	100 Ω
R214	1-202-418	30 kΩ ¼W composition
R215	1-244-726	160 kΩ
R216	1-244-714	51 kΩ
R217	1-244-689	4.7 kΩ
R218	1-244-670	750 Ω
R219	1-244-683	2.7 kΩ
R220	1-244-656	200 Ω
R221	1-244-724	130 kΩ
R222	1-244-706	24 kΩ
R223	1-244-665	470 Ω
R224	1-244-649	100 Ω
R225	1-244-660	300 Ω
R226	1-244-680	2 kΩ
R227	1-244-673	1 kΩ
R228	1-244-673	1 kΩ
R229	1-244-691	5.6 kΩ
R230	1-244-691	5.6 kΩ
R231	1-244-680	2 kΩ print resistor
R232	1-244-705	22 kΩ
R233	1-244-723	120 kΩ
R234	1-244-653	150 Ω
R235	1-244-673	1 kΩ
R236		– discarded –
R237		– discarded –
R238		– discarded –
R239		– discarded –
R240	1-244-697	10 kΩ
R241	1-244-697	10 kΩ
R242	1-244-711	39 kΩ
R243	1-244-656	200 Ω
R244	1-244-667	560 Ω
R245	1-244-713	47 kΩ
R246	1-244-660	300 Ω
R247	1-244-669	680 Ω
R248	1-244-697	10 kΩ
R249	1-244-680	2 kΩ
R250		– discarded –
R251	1-244-697	10 kΩ
R252	1-244-721	100 kΩ
R253	1-244-725	150 kΩ
R254	1-244-721	100 kΩ
R255	1-244-677	1.5 kΩ
R256	1-244-634	24 Ω
R257	1-244-656	200 Ω
R258	1-244-673	1 kΩ
R259	1-244-673	1 kΩ
R260	1-244-705	22 kΩ
R261		– discarded –
R262	1-244-697	10 kΩ
R263	1-244-651	120 Ω
R264		– discarded –
R265	1-244-697	10 kΩ
R266	1-221-635	5 kΩ semi-fixed
✱ R267	1-244-673	1 kΩ
	1-244-676	1.3 kΩ
	1-244-679	1.8 kΩ
	1-244-682	2.4 kΩ
	1-244-685	3.3 kΩ
	1-244-688	4.3 kΩ
R301	1-244-733	330 kΩ
R302	1-244-733	330 kΩ
R303	1-244-717	68 kΩ
	1-244-725	150 kΩ
	1-244-729	220 kΩ
	1-244-732	300 kΩ
R304	1-244-717	68 kΩ
	1-244-725	150 kΩ
	1-244-729	220 kΩ
	1-244-732	300 kΩ
R305	1-244-619	5.6 Ω
R306	1-244-619	5.6 Ω
R307		– discarded –
R308	1-244-721	100 kΩ
R309	1-244-638	36 Ω
R310	1-244-680	2 kΩ
R311	1-244-680	2 kΩ
R312	1-244-666	510 Ω
R313	1-244-673	1 kΩ
R314	1-244-609	2.2 Ω
R315	1-244-609	2.2 Ω
R316	1-244-663	390 Ω
R317	1-244-669	680 Ω
R318	1-244-637	33 Ω
R319	1-244-637	33 Ω
R320	1-244-691	5.6 kΩ
R321	1-202-645-51	1 MΩ ½W composition

MISCELLANEOUS

	1-539-615-14	printed circuit board, fm front end
	1-539-625-12	printed circuit board, cim
	1-539-655-14	printed circuit board, af
	1-581-102-12	printed circuit board, antenna terminal
	8-981-392-10	fm front end, complete
	Y-38383-61-1	mounted circuit board, cim (CIM2)
TEL ANT	1-501-072-20	antenna, telescopic
SP	1-502-266-11	speaker, 8 Ω; 3 pieces
	1-509-324-13	ac connector, 4-pin
S003	1-514-304	slide switch, AFC
S201~S206, S211~S216	1-514-741	slide switch, band select
SL	1-518-006-12	lamp, stereo indicator